Truckee Meadows Flood Control Project
September 2004 Newsletter

US Army Corps of Engineers

Cultural Resources Happenings

The Cultural Resources team continues to work on the historical, architectural, prehistoric, and ethnographic issues within the APE of the Truckee River Flood Control Project.

Area of Potential Effect (APE) - the area where implementation of the project may have the potential to adversely affect potential historic properties.

The team is working work with the Nevada Office of Historic Preservation in developing a PA for the project. The Office has reviewed the first draft of the PA and a second version is in the process of being sent to the Office. As soon as the Corps receives approval for the basic format of the PA, it will be sent to the various stakeholders with an invitation to participate in the process, and to provide comments. When the final comments are incorporated, the PA will be circulated for signature. The final signature will be from the Nevada State Historic Preservation Officer, Mr. Ron James. With Mr. James approval, the PA becomes our commitment to the cultural resources on the project.

Programmatic Agreement (PA) - a document that stipulates procedures for implementation of Section 106 of the National Historic Preservation Act.

The Real Estate and the Cultural Resources teams are working closely together to clarify any issues regarding rights of entry for the field survey work of the Hwy 395 to Vista Reach. The field survey team is mobilizing and will perform fieldwork beginning September 13. The team has completed gathering existing information regarding historic buildings in downtown Reno, and archeological site records for the entire stretch from Booth Street in Reno to Wadsworth, and the Huffaker Hills area. On the Hwy 395 to Vista reach, potential project alternatives may impact the historic Pioneer Ditch with low bench channel improvements. The field survey focuses on identifying potential unknown cultural resources. We also are required to relocate known resources and verify the integrity of them to determine if there is any changes in their physical status since they were last recorded, and rerecord them if necessary. Very little has been discovered on the Hwy 395-Vista reach to date; however, additional survey work is needed. In the near future, additional surveys will occur within the Huffaker Hills area as well as from Vista to Wadsworth.

Floodwall Use and Considerations in Urban Areas

Floodwalls are generally one of the most expensive flood damage reduction features to install and can be considered visually intrusive, so why do we consider them a viable construction option? The answer is simple; floodwalls generally encompass a land area much less than more traditional flood control features, such as embankment levees. To provide the same protection and safety factor for flood flows, a floodwall requires less total area (40–45 lineal feet) than an embankment levee of the same height (100–125 lf). In urban areas and where real estate is limited, and where high value structures currently exist, floodwalls can be used to provide needed flood protection while limiting the impacts to businesses and the community.

In the downtown Reno area there are existing in-channel floodwalls located from just upstream of Arlington Avenue, north bank, and continuing between the existing

bridges to Lake Street, restraining more frequent event flood flows from escaping the Truckee River.

Floodwalls are among the flood protection containment features under consideration for the Truckee Meadows Flood Control Project. Located directly adjacent to the river, floodwalls are built to contain a specific flood event (e.g., the 100-year flow) with additional height added to allow a margin of safety. Floodwalls may be located on-bank (no closer than approximately 15-20 feet from the active riverbank but can be located any distance setback as required) or in-channel, directly adjacent to the riverbank. For areas where passage is needed such as bridges, trails and paths, the area will be spanned by temporary closure structures. These closure structures could include inflatable rubber dams or rolling solid gates.

Typically, floodwalls are L-shaped structures composed of reinforced concrete with the base buried approximately two feet below the ground surface. The width of the exposed floodwall can vary from one to two feet. The width of the underground base is about equal to the height of the floodwall.

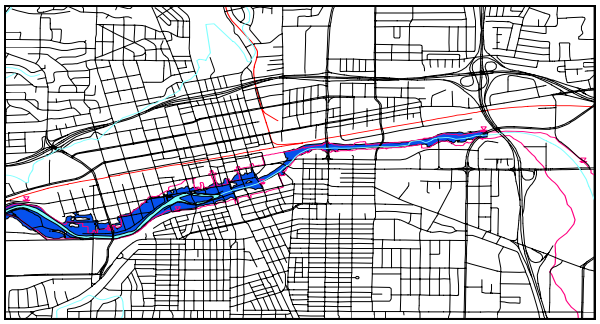
One potential area of concern with any flood control structure is seepage. Seepage is the movement of water, due to high stages in the river or tributary, beneath the floodwalls or other flood damage reduction feature through the riverbed and riverbank to the landside of the structural feature. This movement creates a head of pressure that unless relieved or controlled will cause a rupture of the landside materials, concentrate the seepage flows and potentially fail the feature by loss of stability of its foundation. Relief wells, under seepage berms, etc. are used to control the effects of the seepage pressures. For the alternatives being considered, wells or drains will be located just to the landside of the floodwalls to control seepage of water under the floodwall.

The visual appearance of floodwalls may be softened by terracing, i.e., the installation of the floodwalls with landscaped areas between varying increasing heights (this would require additional land area and be more expensive) or incorporating pleasing shapes or forms into the wall face treatment.

Truckee River Downtown Modeling

When the initial modeling of the Truckee River was initiated through downtown, the HEC-RAS model was built as a non-spatially geo-referenced, steady state model that was capable of adequately modeling flows up to about the 100-year event. After some discussion, it was determined that the model was not suitable for modeling larger flows because it was not built to allow flows to leave the river and flow into the adjacent watersheds located north and south of the Truckee River. In order to accommodate this need, the Sacramento District, with help from the Corps' Hydrologic Engineering Center (HEC), rebuilt the HEC-RAS model with several upgrades. These improvements included geo-referencing the model, adding overbank reaches to allow flow to leave the river to the adjacent watersheds, making the model run unsteady, and updating of the geometry to include the Whitewater Park features within the river as well as the ReTRAC project on the north side of the river.

Model re-construction and calibration is now complete. The model was calibrated to match recorded stages from the 1997 event. The existing condition hydrographs for the 2- through 500-year events have been run through the model and new floodplains have been generated for economic damage analyses. The figure below is a comparison of the floodplain from the original modeling of the 1997 flood event to the 100 year existing conditions floodplain using the new updated HEC-RAS model.



Key:
Blue fill: 100 year floodplain
Magenta lines: 1997 floodplain outline
Black lines: streets
Red lines: railroads`
Light blue lines: river and creek alignments

Update: Truckee Meadows Hydraulic Modeling

Hydraulic modeling of the proposed alternatives in the Truckee Meadows area (Highway 395 to Vista) is continuing using the HEC-RAS computer model developed in support of the Community Coalition Plan. In addition to the Truckee River, the model includes the main tributaries and storage areas outside of the channel. Additional modeling of shallow flooding outside of the channel is being accomplished using another model (FLO-2D) in the vicinity of the airport for the 500-year event.

Hydraulics is the movement of water from point a to point b.

The HEC-RAS model has required calibration to enable the model to be used to conduct the wide range of sensitivity analyses necessary to support the Corps' economic risk analysis. These improvements have included allowances for variation in potential worst- and best-case variables such as how rough or smooth the channel is; amount of debris obstruction on bridge piers; and factors to account for flow leaving and entering the channel. It is also important to note that the model is required to produce stable results for a wide range of discharge events including the 5- through 500-year floods as opposed to just the 100-year event on which the model originally focused.

Mapping of the project floodplains is ongoing for the three alternatives currently being studied by the Corps. At this time, floodplains for the Community Coalition Plan have been completed and floodplain delineation for the other alternatives will be completed shortly. Model stability issues have been the biggest deterrent in completing the floodplain delineation efforts for the large events (200- and 500-year). Additional effort is required to conduct the risk analysis to determine the floodwall and levee heights that are set to meet or exceed FEMA 100-yr flood capacity requirements prior to generation of the various n-year floodplains.

Upcoming Meetings

September 29th – The Corps is meeting with the project sponsors to share the findings of the downtown economic analysis.

October 26th Public Workshop in Wadsworth
The purpose of the workshop is to discuss solutions to potential flood areas downstream of Vista with the proposed project features in place in the Truckee Meadows area. The workshop will require the public to come up with solutions for minimizing any possible flood impacts. Additional discussion on this workshop will be provided in the October Newsletter.

Next Newsletter

Coming up next month: meet members of the Corps team, downstream workshop introduction, and additional project features defined.

Making Contact

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www.spk.usace.army.mil/projects/civil/truckeemeadows
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